

THE TENNESSEE TYPE LOCALITY OF *ALLOCAPNIA PERPLEXA* AND A NEW KENTUCKY LOCATION FOR *ALLOCAPNIA CUNNINGHAMI* (PLECOPTERA:CAPNIIDAE)¹

R.F. Kirchner^{2,5}, B.C. Kondratieff³, R.E. Zuellig⁴

ABSTRACT: The type locality stream of the winter stonefly *Allocapnia perplexa* is putatively identified in Sumner and Trousdale counties, Tennessee. Additionally, a new Kentucky locality for *A. cunninghami* is noted. Detailed collection records for the above species and *A. brooksi* are given. All three species are considered imperiled throughout their range.

In 1999, Kondratieff and Kirchner attempted to recollect the adults of three rare winter stoneflies of the genus *Allocapnia* (*A. brooksi* Ross 1964, *A. cunninghami* Ross and Ricker 1971, and *A. perplexa* Ross and Ricker 1971) from their type localities in Tennessee. These species were only known from the original type series, and were last collected over 30 years ago (Kondratieff and Kirchner 1999). Adults of *A. brooksi* and *A. cunninghami* were collected in 1999, but not *A. perplexa*. In early March 2001, we attempted to recollect *A. perplexa* again, and were successful in collecting 10 ♂ and 4 ♀ from the East Fork of Bledsoe Creek watershed (Sumner and Trousdale counties).

Ross and Ricker (1971) described *A. perplexa* from 4 ♂ and 1 ♀, and the type locality indicated was: "Tennessee, Trousdale County, 5 miles south of Bransford, at murky stream". After collecting at many sites south of Bransford, we collected *A. perplexa* only from East Fork and a small branch to East Fork (Fig.1). We think that East Fork of Bledsoe Creek is the type stream, and the type locality was probably at the US-231 bridge (N36°27'2.28" W86°16'1.81") in Trousdale County. East Fork is a small watershed located in the Outer Nashville Basin of the Interior Plateau of Tennessee with approximately 20.72 km² in Sumner County and 5.18 km² in Trousdale County. The region includes most all of the outer areas with generally non-cherty Ordovician limestone bedrock. The higher hills and knobs are capped by cherty Mississippian-age formations, and some Devonian-age Chattanooga shale, and remnants of the Highland Rim Physiographic Province. Deciduous forest, pasture and cropland are the major land covers. East Fork is a low to moderate gradient stream with limestone bedrock (Fig.1) with interspersed rubble substrate.

¹ Received April 5, 2002. Accepted May 25, 2002.

² US Army Corps of Engineers, Huntington District, Water Quality Section, P.O.Box 9, Apple Grove, WV 25502.

³ Colorado State University, Department of Bioagricultural Sciences and Pest Management, Fort Collins, CO 80523.

⁴ Colorado State University, Department of Fishery and Wildlife Biology, Fort Collins, CO 80523.

⁵ The views of the author do not purport to reflect the position of the Department of the Army or the Department of Defense.



Figure 1. Photographs of (A) the East Fork of Bledsoe Creek looking upstream from the Chipman Road Bridge at Chipman, $N36^{\circ}26'54''$ W $86^{\circ}16'37''$, and (B) an unnamed tributary to the East Fork of Bledsoe Creek looking downstream from the Homer Scott Road Bridge southeast of Chipman, $N36^{\circ}26'17''$ W $86^{\circ}16'14''$ (TN: Sumner Co. 1/2-III-2001).

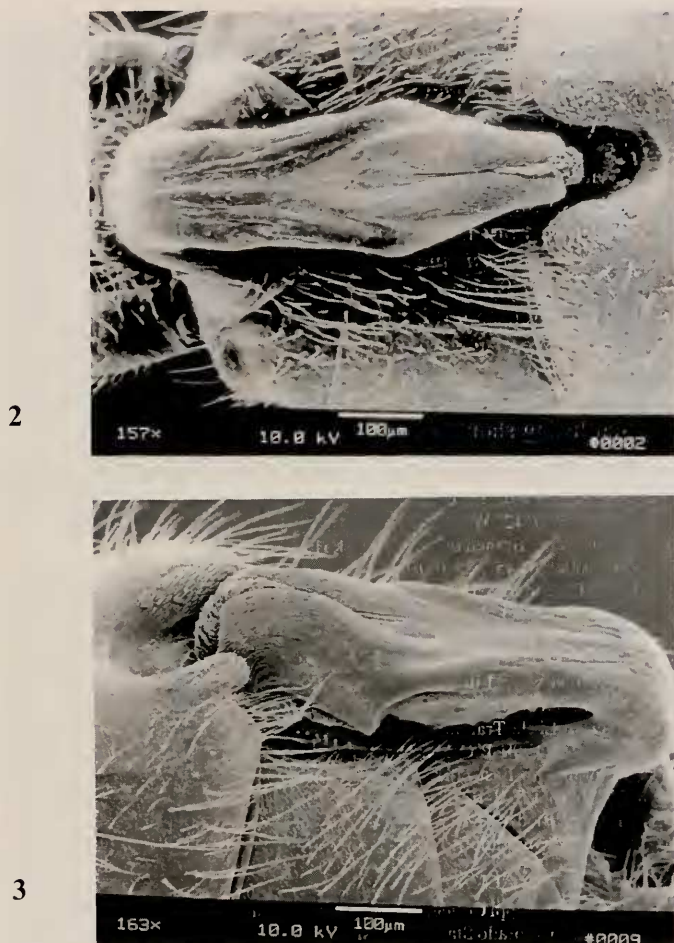


Figure 2-3. *Allocapnia perplexa*. Scanning electron photomicrograph of 2, Male terminalia, dorsal, 157X. 3, Male terminalia, lateral, 163X.

Ross and Ricker remarked that "The peculiar, incised eighth tergite and massive epiproct differentiate this species immediately from all other described forms," and "the short, large apical segment of the upper limb of the epiproct is suggestive of the *rickeri* group." Figures 2 and 3 illustrate the distinctive form of the male terminalia. Associate species of *Allocapnia*, collected with *A. perplexa*, were *A. recta* (Claassen), *A. rickeri* Frison and *A. tennessee* Ross

and Ricker.

Ross and Ricker (1971) described *A. cunninghami* from specimens collected from Tennessee and Kentucky. The only Kentucky paratype recorded was from "Cumberland Co., Bow, Cash Creek, December 30, 1964, H.H. Ross and R.T. Allen, 1 male." In March 2001, we collected a male at the KY-80 / Jack Sparks Road bridge 1.8 miles east Gascon. *Allocapnia cunninghami* has been taken only in spring fed streams. This specimen probably came from Butler Branch of the East Fork Little Barren River at this location.

All specimens of *A. brooksi*, including those previously mentioned by Kondratieff and Kirchner (1999) are listed below to indicate the known distribution of these rare winter stoneflies. It should be noted that all the areas in Tennessee where the above species have been collected are highly impacted by past and current agricultural practices and other disturbances. These species are, no doubt, imperiled throughout their ranges, and it is strongly suggested that potential listing should be considered.

SPECIMENS EXAMINED

Allocapnia brooksi: TN: Sevier Co., Gists Creek of Little Pigeon River, US-441 bridges 1.5 miles west of Sevierville, N35°51'42" W83°37'08", 25-II-1999, B.C. Kondratieff, R.F. Kirchner, 2♂ 3♀; Sullivan Co., Blair Gap Branch of Walker Fork Horse Creek, Beech Creek road bridge at Blair Gap, N36°27'01" W82°40'45", 25-II-1999, B.C. Kondratieff, R.F. Kirchner, 1♂; same location but 25-II-2001, B.C. Kondratieff, R.F. Kirchner, R.E. Zuellig, 3♂; Sullivan Co., Horse Creek, TN-93 bridge N of Fall Branch, N36°26'14.1" W82°37'31.5", 25-II-1999, B.C. Kondratieff, R.F. Kirchner, 3♂ 1♀. *Allocapnia cunninghami*: KY: Metcalfe Co., KY-80 / Jack Sparks Road bridge east of Gascon, N37°00'51" W 85°32'29", 2-III-2001, B.C. Kondratieff, R.F. Kirchner, R.E. Zuellig, 1♂; TN: Sumner Co., Little Trammel Creek, old US-31E bridge 1 mile south of Turners Station, N36°35'46" W86°16'09", 22-II-1999, B.C. Kondratieff, R.F. Kirchner, 1♂; Sumner Co., small branch to Little Trammel Creek, old US-31E bridge south of Sugar Grove, N36°37'21" W86°16'03", 22-II-1999, B.C. Kondratieff, R.F. Kirchner, 4♂. *Allocapnia perplexa*: TN: Sumner Co., small branch to East Fork of Bledsoe Creek, Homer Scott road southeast of Chipman, N36°26'17" W86°16'14", 1-III-2001, B.C. Kondratieff, R.F. Kirchner, R.E. Zuellig, 1♂; Sumner Co., East Fork of Bledsoe Creek, Chipman road bridge at Chipman, N36°26'54" W 86°16'37", 1/2-III-2001, B.C. Kondratieff, R.F. Kirchner, R.E. Zuellig, 9♂ 4♀.

ACKNOWLEDGMENTS

We thank Bill P. Stark, Mississippi College, Clinton, for providing the SEM photomicrographs of *A. perplexa*. Phyllis Pineda, Colorado State University, assisted in preparing the plates.

LITERATURE CITED

- Kondratieff, B.C. and R.F. Kirchner. 1999. In search of rare *Allocapnia* (Capniidae). *Perla* 17: 63-65.
- Ross, H.H. 1964. New species of winter stoneflies of the genus *Allocapnia* (Plecoptera: Capniidae). *Entomol. News* 75: 169-177.
- Ross, H.H. and W.E. Ricker. 1971. The classification, evolution, and dispersal of the winter stonefly genus *Allocapnia*. III. *Biol. Monogr.* 45:1-166.